Regulatory Finance Concepts Educational Seminar
Session 4: The Cost of Equity
Presented to the
Public Service Commission of South Carolina
December 30, 2020

Carl Pechman, Ph.D.
Director – National Regulatory Research Institute

NRRI
www.nrri.org

The Cost of Debt v. Equity

- The cost of debt is a contractual cost, but the cost of equity is an *expectational cost*
  - The return that investors must expect or anticipate receiving to induce them to provide equity funds
- The cost of equity must be estimated
  - Often the subject of considerable debate
  - Generally more difficult to determine than the cost of debt

Cost of Equity Issues

- A reasonable return on invested capital is part of the revenue requirement
- Often one of the most contentious issues in a rate case involves determining a reasonable rate of return on rate base
- There are many assumptions and judgement must be used to calculate the cost of equity

Estimating Cost of Debt and Equity

- Both Debt and Equity have income streams that establish their value.
- The income stream of debt is fixed when the bond is issued
- The income stream for equity varies over time depending on a variety of circumstances
- The cost of debt is a function of the utility's credit rating
- The cost of equity is dependent upon investor expectations of its performance
- Estimating the cost of equity requires forecasting future performance

Estimating the Cost of Equity

- Numerous methods have been suggested and used
  - Comparable earnings analysis
  - Risk-premium analysis
  - Discounted cash flow (DCF)
  - Capital asset pricing model analysis (CAPM)

Models of the Cost of Equity have Different Perspectives

- Discounted cash flow (DCF) is based on the time value of money
- Capital Asset Pricing Model is based on the notion that a securities return is equal to the risk-free rate of return plus a risk-adjusted risk premium
- Risk Premium Method recognizes that common equity is riskier than debt and therefore must earn a premium over debt.
- Comparable earnings method is based upon accounting concepts of earnings per share and the book value of common equity per share.
- Expected earnings is a forward-looking version of comparable earnings
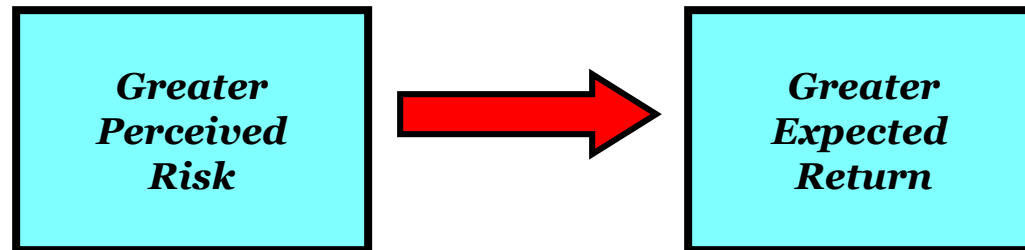
Using multiple methods and estimates

- Each method provides a different model for the future

- Within each method, there may be multiple alternatives as to how to frame the future

- Using alternative models brings different perspectives

- Various inputs have different impacts on models

- It is the role of the Commission to weigh the evidence presented and determine the relative weight to give different models and assumptions

Comparable Earnings Analysis

- Based on *Bluefield*
- Attempts to determine what rates of return on equity are being earned by other firms
  - May use the Fortune 500 or the S&P 400 or 500 as a basis
  - Estimates the cost of equity (K_E) based on average reported returns of other firms
- May not account for risk differentials; there is no guarantee that reported equity returns reflect the cost of equity
- Need to establish a peer group

Risk-Premium Analysis

- Based on one of the fundamental ideas of finance:

| Greater Perceived Risk | → | Greater Expected Return |

Risk-Premium Analysis *(cont'd)*

- Estimates the cost of equity (K_E) as the current bond yield plus an equity risk premium
  - Premium might be based on the historical average spread between stock and bond returns
  - Could use either government or corporate bond yield as basis

10

Risk-Premium Analysis *(cont'd)*

- Cost of equity rises and falls with bond yields

- Assumes that relative risk premium will be stable

- May have to be adjusted if company is more or less risky than average

- Need to determine an appropriate historical time frame for analysis

Risk-Premium Analysis *(cont'd)*

- Example:
  - ✓ Avg. annual return on large company stocks (1925-2015) = 11%
  - ✓ Avg. annual return on long-term treasury bonds (1925-2015) = 5.3%
  - ✓ This yields an average annual equity risk premium of 5.7%
  - ✓ Therefore, given a current long-term treasury yield of 5.5%, the implied expected return on large company stocks would be 11.2%

Use of Proxy Groups a Shared Analytical feature of DCF and CAPM

- Both the DCF and CAPM require using proxy groups
- Proxy groups are companies "like" for whom the cost of capital is being forecast
- DCF uses proxy companies to estimate expectations of future growth
- CAPM uses proxy companies to estimate β
- The choice of the proxy group frames the analysis and can have an important impact on results

Discounted Cash Flow (DCF) Analysis

- Based on notion that equity investors have two sources of return
  - ❖ Dividend yield
  - ❖ Growth in value
- The cost of equity, K_E, is estimated by

$$K_E = \frac{D}{P} + g$$

  - ✓ "D/P" is an estimate of the yield over the next year
  - ✓ "g" is an estimate of long-term growth in dividends

- The cost of common equity is equal to the dividend yield plus dividend growth

Critical assumptions in DCF

- Constant average growth rate for dividends and earnings
- Stable ratio of dividend payout
- A constant P/E (Price to Earnings ration)
- The discount rate must be greater than the expected growth rate

15

DCF Analysis – Example

- Suppose D = $1.20, P = $30.00, and your estimate of g = 7%

The DCF estimate of K_E would be

$$K_E = (1.20/30) + .07$$

$$= .04 + .07 = .11$$

$$\text{or } 11\%$$

<u>Note</u>: This might be adjusted upwards a bit to allow for flotation costs – the cost of issuing new stock.

DCF Analysis *(cont'd)*

- Calculating the dividend yield is fairly straightforward
  - ❖ It's the estimated yield over the next year given current stock price; that is, the current dividend adjusted for growth divided by the current price
- Estimating growth is more difficult and uncertain – best practices for establishing the growth rate
  - ❖ Simple DCF models assume stable growth rates
- Small changes in the growth estimate make for large changes in K_E and in $ of revenue requirement

Capital Asset Pricing Model (CAPM)

- The simplifying assumption underlying CAPM is that rational investors hold a highly diversified portfolio i.e. the market portfolio.
- CAPM focuses on security's risk relative to the market portfolio and ignores firm specific risk.
- According to CAPM, required rate of return is equal to the risk-free rate of return plus a risk premium that reflects the riskiness of the stock after diversification. Firm-specific risk does not enter into the calculation of the required return in CAPM.

$$ks = kRF + (kM - kRF)\,ß$$

- where: ks= return on firm's equity,
- kRF= risk free rate,
- kM= return on overall market portfolio,
- (kM - kRF)= market risk premium,
- ß= firm's market risk.

Requirements for Calculating CAPM

- Risk Free Rate – typically Treasury bonds
- Market Risk Premium – return on the broad stock market minus the risk-free interest rate
- ß, firm's market risk is measured by the covariance between the risk free rate and return on the market as a whole, where covariance is a measure of joint variability of two variables.
- Each of these variables is forward looking and requires judgment which need to be understood by the staff and the Commission.

Cost of Equity: Final Thoughts

- Methods can be adjusted to reflect business and financial risk

- Each of the above methods requires exercise of the analyst's judgment and expertise

- There is a "zone of reasonableness" for the fair rate of return – and the allowed return on equity

- There is no guarantee that the firm will, in fact, earn the rate of return allowed by the commission
  - The firm is given the opportunity to earn that return given efficient and economical management